Chlorophyll a in Antarctic sea ice from historical ice core data

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Sea ice core chlorophyll a data are used to describe the seasonal, regional and vertical distribution of algal biomass in Southern Ocean pack ice. The Antarctic Sea Ice Processes and Climate - Biology (ASPeCt - Bio) circumpolar dataset consists of 1300 ice cores collected during 32 cruises over a period of 25 years. The analyses show that integrated sea ice chlorophyll a peaks in early spring and late austral summer, which is consistent with theories on light and nutrient limitation. The results indicate that on a circum-Antarctic scale, surface, internal and bottom sea ice layers contribute equally to integrated biomass, but vertical distribution shows distinct differences among six regions around the continent. The vertical distribution of sea ice algal biomass depends on sea ice thickness, with surface communities most commonly associated with thin ice ($<$0.4 m), and ice of moderate thickness (0.4--1.0 m) having the highest probability of forming bottom communities.